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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GUBIOTTI, MATTHEW P

ART UNIT	PAPER NUMBER
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2124

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DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/637,078

Applicant(s)

ALTMAN ET AL

Examiner

Matthew Gubiotti

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☒ Claim(s) 32,33,35,36 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 11 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to because they contain hand written elements. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim (See e.g. Claim 32). It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

Specification

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 32 and 33 recite the limitation "apparatus". There is insufficient antecedent basis for this limitation in the claim. The claims has been further discussed below with the limitation treated as reading "method". The Examiner presumes that the Applicant intended Claim 32 to depend upon Claim 23, but has treated the claim language below as it exists in its current form.

5. Claims 35 and 36 recite the limitation "apparatus". There is insufficient antecedent basis for this limitation in the claim. The Examiner has treated the claim language below as it exists in its current form.

6. Claims 16-21 recite the limitation "profile matrix". There is insufficient antecedent basis for this limitation in the claim. The claim has been further discussed below with the limitation treated as "profile counts".

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 1, 2, 4, 5, 9, 10-12, 16, 22, 23, 25, 26, 30-33, 37, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Agrawal (U.S. Pat. No. 5,768,500).

Claim 1

Agrawal teaches a method for profiling a computer program, comprising the steps of:

Executing a program (col.8, li.10-14); and

Storing, in separate and distinct memory ("down-counter"), profile counts for events associated with the execution of the computer program (col.8, li.40-43; Compare fig.1, refs.112 & 104);

Claim 2

Agrawal further teaches updating the counts (col.8, li.38-43);

Claims 4 & 5

Agrawal further teaches wherein the updating is triggered by events (col.8, li.38-40). Agrawal further teaches wherein the updating is triggered by instructions embedded into an instruction stream ("state or detect accesses"; col.9, li.61-65).

Claim 9

Agrawal further teaches accumulating profile updates; and dividing the profile updates by a threshold fraction (col.18, li.25-29) (discussing the ratio of monitoring overhead to total execution time of program).

Claim 10

Agrawal further teaches scaling the counts to prevent overflow (col.16, li.15-27). The generation of an interrupt at a prespecified value of counter is effective to scale the number of counts to prevent an overflow.

Claims 11 & 12 and 32 & 33

Agrawal teaches a profiling method comprising the step of identifying profile information corresponding to the profile counts using a profiling identifier and addressing the memory array, using the profiling identifier ("process ID"; col.11, li.59-61).

Claim 16

Agrawal further teaches supporting read operations from the profile matrix in an offline optimization of the program (col.2, li.52-55).

Claim 22

Agrawal further teaches wherein the memory array is separate and distinct from the memory hierarchy, which includes

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data and instruction caches (col.8, li.57-63; Compare fig.1, refs.112 & 104).

Claim 23, 25, 26, 30, 31, 37, and 38

These claims represent an apparatus performing the method disclosed in Claims 1, 2, 4, 5, 9, 10, and 22. The claims are rejected for the reasons stated above with the apparatus disclosed as follows (col.8, li.34 to col.9. li.16; See Fig.1).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3, 6-8, 13-15, 24, 27-29 & 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal as applied to claim 2 above, and further in view of Record (U.S. Pat. No. 5,355,484).

Claims 3

Agrawal teaches a method of profiling that prevents a decrease in the performance of a computer system (See Abstract),

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but does not expressly disclose that the storing and updating of counts occurs asynchronously. Record, in an analogous art, teaches a profiling method wherein storing and updating of counts occurs asynchronously (col.1, li.52-53; col.2, li.48-55) (discussing the storage and delayed transfer of an event to a event handler).

It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to combine the asynchronous updating of counters disclosed by Record into the profiling method of Agrawal. The modification would have been obvious because one of ordinary skill would have been motivated to minimize any reduction in execution time resulting from profiling a system, as taught by Agrawal (col.1, li.46-51), and suggested by Record (col.2, li.17-25).

Claims 6 & 7

Agrawal teaches a method of detecting and indicating that a predefined count threshold has been meet (col.8, li.40-46). Agrawal does not expressly disclose that the profiling method detects and indicates when a count threshold has been exceeded. Record, in an analogous art, teaches a profiling method that detects and indicates when a count threshold has been exceeded (col.9, li.8-15; col.12, li.31-38 & 47-61).

It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to combine the profiling technique disclosed by Record into the method of Agrawal. The modification would have been obvious because one of ordinary skill would have been motivated to minimize any reduction in execution time resulting from profiling a system by limiting the number of events to be monitored to a finite quantity, as taught by Agrawal (col.8, li.7-14), and suggested by Record (col.2, li.17-25).

Claim 8

Agrawal further teaches a method wherein the indicating step comprises the step of raising an exception ("interrupt"; col.8, li.40-43).

Claims 13-15

Agrawal teaches generating profile counts using profile counters associated with events (col.8, li.28-43) and maintaining the profile counters in a set-associate manner (col.9, li.56-65). Agrawal does not expressly teaches the details of the set-associate manner as disclosed. In an analogous art, Record teaches selecting a profile counter to be evicted from memory base upon a predefined replacement, when a number of profiling events assigned to a class of events is exceeded (col.9, li.13-20). Record further teaches a

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replacement strategy based upon one of the least-recently-used or first-in-first-out (col.9, li.13-20) (replacing the oldest bound signal with the newest event signal).

It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to combine the profiling technique disclosed by Record into the method of Agrawal. The modification would have been obvious because one of ordinary skill would have been motivated to minimize any reduction in execution time resulting from profiling a system by limiting the number of events to be monitored to a finite quantity, as taught by Agrawal (col.8, li.7-14), and suggested by Record (col.2, li.17-25).

Claim 24, 27-29 & 34-36

These claims represent an apparatus performing the method disclosed in Claims 3, 6-8, and 13-15, respectively. The claims are rejected for the reasons stated above with the apparatus disclosed as follows (col.8, li.34 to col.9. li.16; See Fig.1).

11. Claims 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal as applied to claim 2 above, and further in view of Bala (U.S. Pat. No. 6,351,844).

Claim 17-21

Agrawal teaches a method of assisting in the optimization of a program, based upon profile counts stored in a profile matrix (col.2, li.47-55), but does not expressly teach the limitations as disclosed. In an analogous art, Bala teaches a dynamic optimization method wherein assisting is performed during at least one of binary translation and optimization of the program (col.2, li.64-65). Bala further teaches wherein the binary translation and optimization results in translated and optimized code, comprising instruction groups which pass control there between (col.3, li.14-53). Bala further teaches identifying frequently executed paths in the program, and extending the instruction groups along the frequently executed paths ("identifying cycling regions"; col.13, li.60 to col.14, li.2).

It would have been obvious to a person of ordinary skill in the art, at the time of the invention, to combine the optimization technique disclosed by Bala into the method of Agrawal. The modification would have been obvious because one of ordinary skill would have been motivated to utilize profiling information dynamically to optimize system execution time, as taught by both Agrawal (col.2, li.47-55) and Record (col.2, li.60-65).

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Gubiotti whose telephone number is (703) 305-8285. The examiner can normally be reached on M-F, 8-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

MPG
April 17, 2003


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